

WHAT IS CLAIMED IS:

1. A toothbrush comprising:
needle-shaped bristles of polyester resin, which are 0.1 to 0.2mm thick
5 before tapering, 13 to 18mm long, tapered 4 to 8mm only on one end with a
tapered tip thickness of 0.01 to 0.08mm, and planted to be 7 to 13mm high in the
toothbrush.
 2. The toothbrush of claim 1, wherein the tapered tips of the
10 needle-shaped bristles are 0.01 to 0.03mm thick.
 3. The toothbrush of claim 1, wherein the tapered tips of the
needle-shaped bristles are 0.03 to 0.08mm thick.
 - 15 4. The toothbrush of claim 1, wherein part of the needle-shaped
bristles are 0.01 to 0.03mm thick in tip thickness and the other needle-shaped
bristles are 0.03 to 0.08mm thick in tip thickness.
 5. The toothbrush of claim 1, wherein the needle-shaped bristles are
20 inserted in a head insert and thermally fused to be fixed to the head insert.
 6. The toothbrush of claim 5, wherein the head insert having the
needle-shaped bristles is mounted in an opening of the head of the toothbrush and
attached to the toothbrush head by ultrasonic bonding.
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7. The toothbrush of claim 1, wherein the needle-shaped bristles
differ in length by 1 to 10mm.
 8. A method of manufacturing a toothbrush having needle-shaped
30 bristle tapered only on one end, comprising the steps of:

inserting non-tapered portions of the bristles into through holes of a head insert;

thermally fusing the non-tapered portions of the bristles protruding from the bottom of the head insert, thereby fixing the bristles to the head insert; and

5 attaching the bottom of the head insert to the head of the toothbrush.

9. The method of claim 8, wherein the head insert is attached in an opening formed in the head of the toothbrush in the attaching step.

10 10. The method of claim 9, wherein the head insert is attached in the opening by one of ultrasonic bonding and high frequency bonding.

11. The method of claim 8, further comprising the step of adjusting the tip thickness of the bristles fixed in the head insert by cutting the tips of the
15 bristles and grinding the cut tips.

12. The method of claim 8, wherein the tapered tips of the bristles are 0.01 to 0.08mm thick.

20 13. The method of claim 12, wherein the tapered tips of the bristles are 0.01 to 0.03mm thick.

14. The method of claim 12, wherein the tapered tips of the bristles are 0.03 to 0.08mm thick.

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15. A method of manufacturing a toothbrush having needle-shaped bristle tapered only on one end, comprising the steps of:

 inserting non-tapered portions of the bristles into through holes of a head insert;

30 thermally fusing the non-tapered portions of the bristles protruding from

the bottom of the head insert, thereby fixing the bristles to the head insert;
attaching the bottom of the head insert to an upper metal mold;
combining the upper metal mold with a lower metal mold; and
injecting resin into the lower metal mold through an inlet, thereby
5 attaching the head insert to the head of the toothbrush.

16. A method of manufacturing a toothbrush having needle-shaped
bristle tapered only on one end, comprising the steps of:
inserting non-tapered portions of the bristles into through holes of a
10 lower metal mold to protrude 2 to 5mm from the lower metal mold;
thermally fusing the protrusions;
combining an upper metal mold with the lower metal mold; and
injecting resin into the upper and lower metal molds, thereby fixing the
bristles directly to the head of the toothbrush.